

Fig. 1

FIG. 2

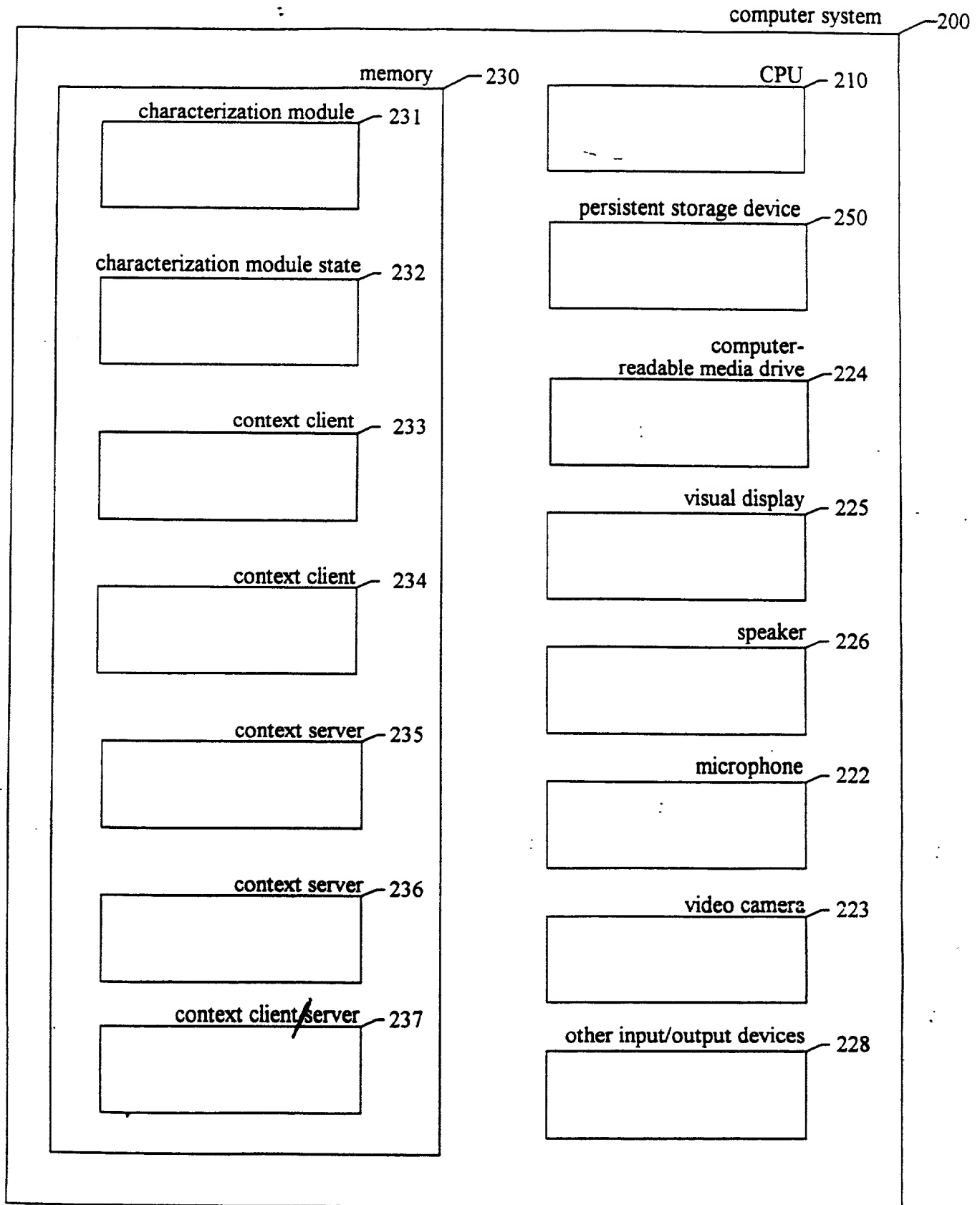


Fig. 2

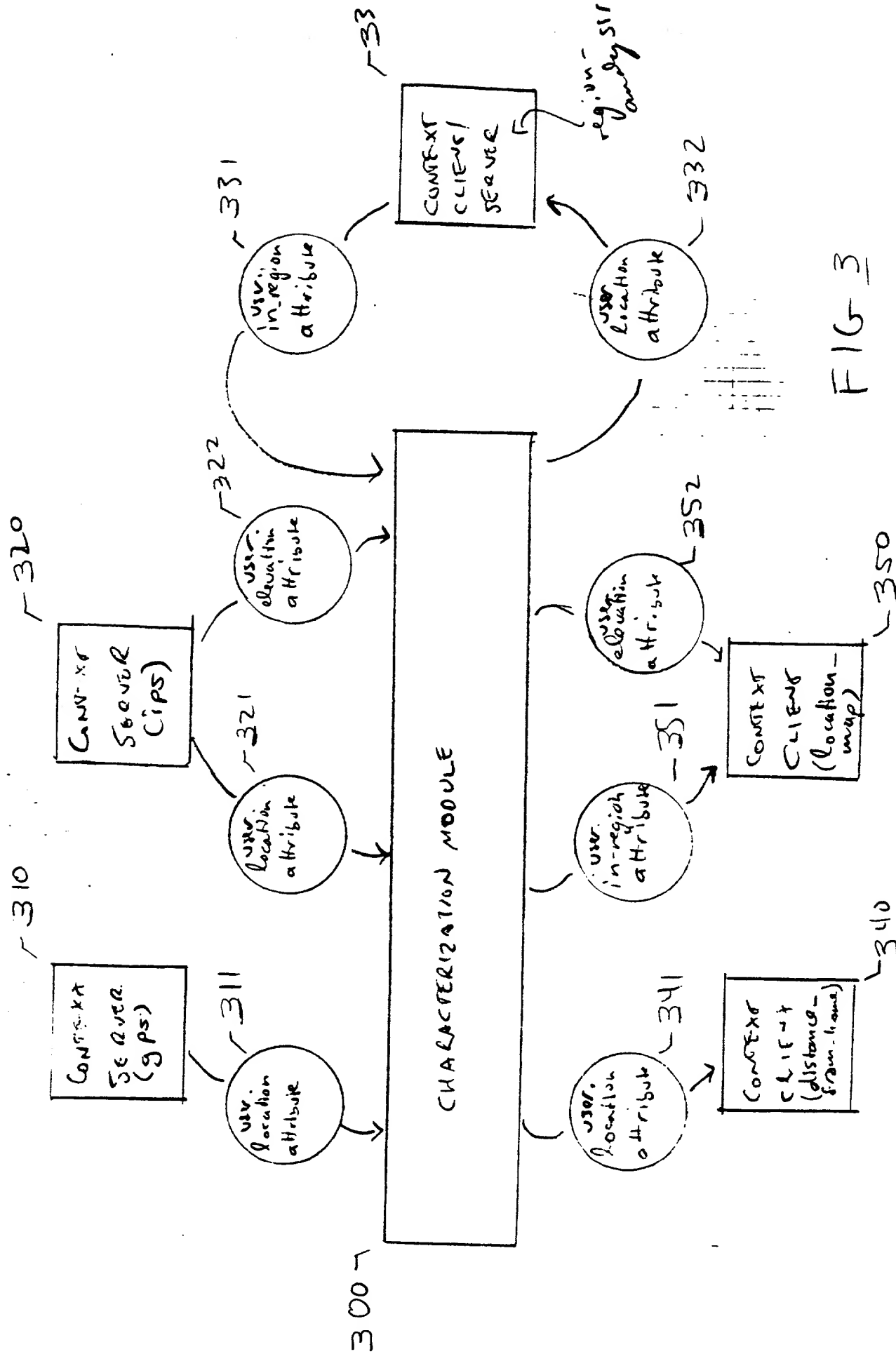


FIG. 3

FIG 4

400

context server table

context server name	version	installation date	filename	request handler
gps	1	2/10/2000	gps.exe	(reference)
ips	1	2/21/2000	ips.exe	(reference)
location_region_analysis	1	2/10/2000	l r a.exe	(reference)

FIG 4

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22	5	13:11:01.118 2/22/2000	meters	1
user.in_region	location_region_analysis	none	none	none	none	0

600

context client table

context client name		message handler
location_map	(reference)	
distance from home	(reference)	
region_analysis	(reference)	

601
602
603

612

611

FIG 6

700

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22	.5	13:11:01.118 2/22/2000	meters	1
user.in_region	location_region_analysis	none	none	none	none	1

701
702
703
704

711 712 713 714 715 716 717

FIG 7

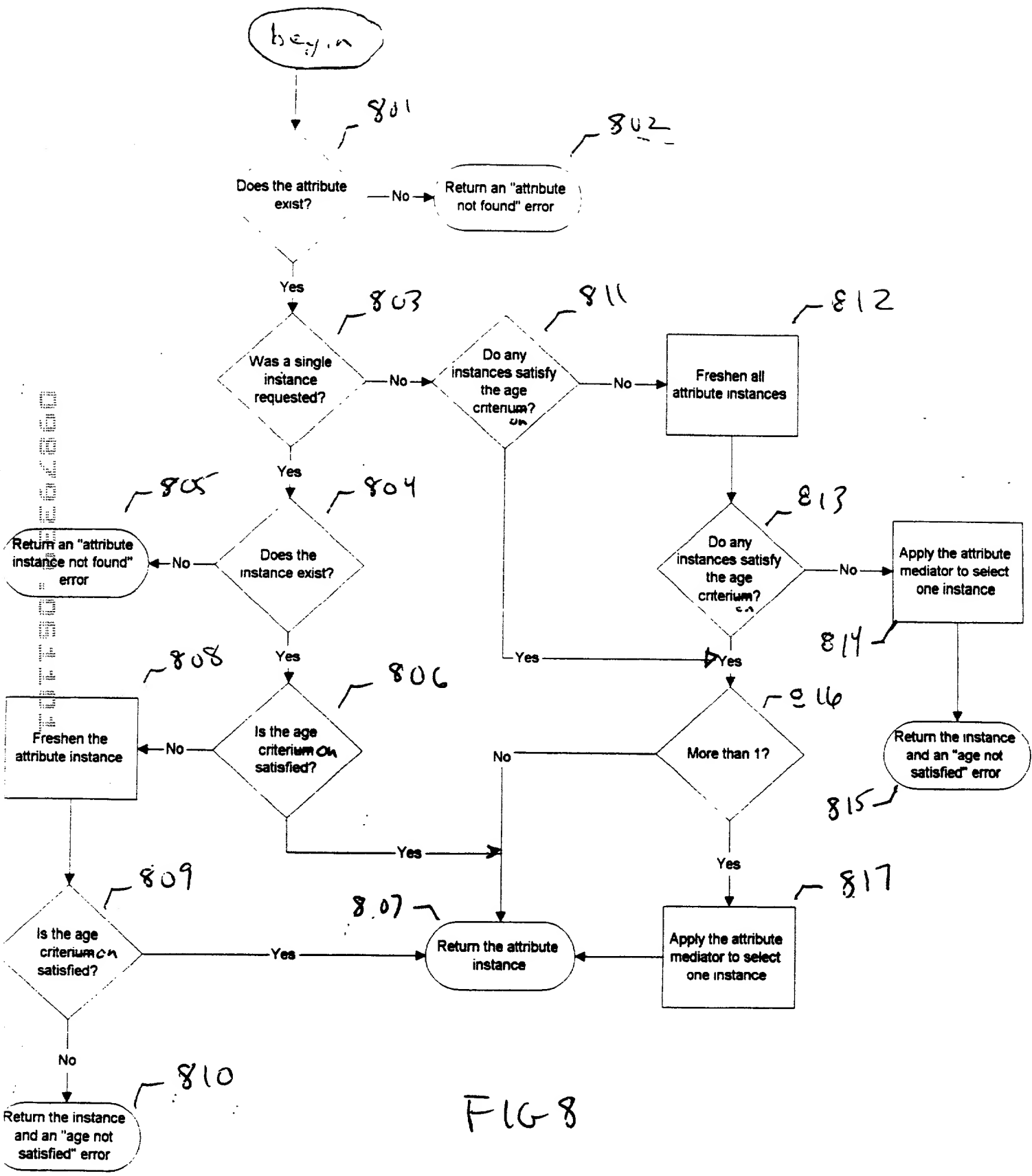


FIG 8

FIG 9

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22.25	.5	13:11:06.565 2/22/2000	meters	1
user.in region	region analysis	none	none	none	none	1

FIG 9

condition table

condition name	context client name	first logical parameter	second logical parameter	comparison value	logical operator
in region true	region analysis	user.in region	none	TRUE	=

FIG 10

FIG 11

condition monitor table

condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analyses	in_region_true	TRUE or FALSE	30	13:11:29.101 2/22/2000	(reference)	no

FIG 11

condition monitor table

condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analyses	in_region_true	TRUE or FALSE	30	13:11:59.101 2/22/2000	(reference)	yes

FIG 12

1310

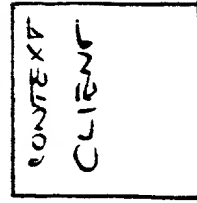
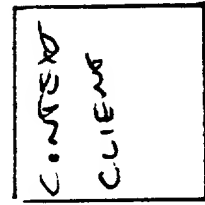
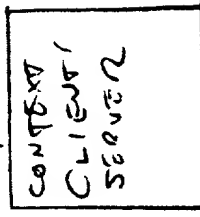
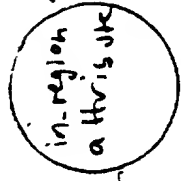
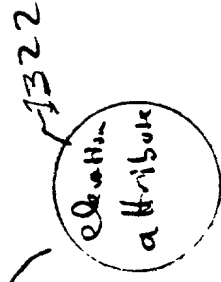
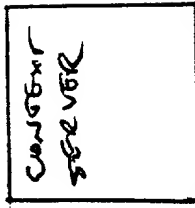
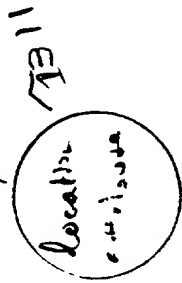
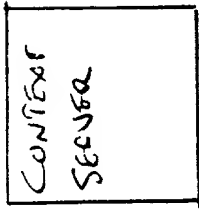
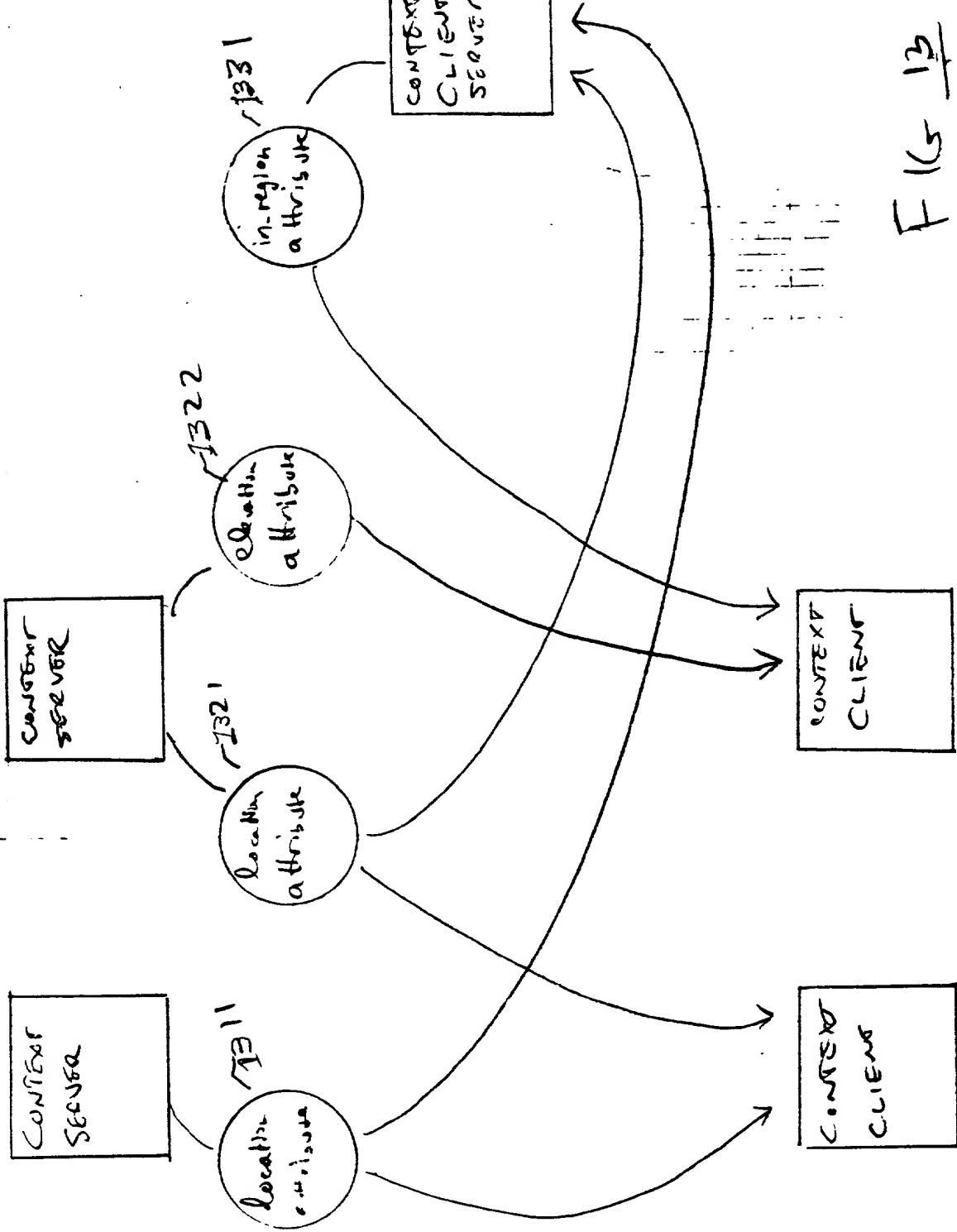


FIG. 13



1401 ~
1402 ~
1403 ~
1404 ~

attribute name	context client name
user.location	distance_from_home
user.in_region	location_map
user.location [gps]	location_region_analysis
user.elevation	location_map

L 1411

2 1412

[illegible]

User.

Desired_privacy_level
 Interruptibility
 Speed
 Direction
 Acceleration
 Availability.
 Cognitive_availability
 Tactile_availability
 Manual_availability
 Visual_availability
 Oral_availability
 Auditory_availability
 Proximity.<Item or place name>
 Mood.
 Happiness
 Sadness
 Anger
 Frustration
 Confusion
 Activity.
 Driving
 Eating
 Running
 Sleeping
 Talking
 Typing
 Walking
 Location.
 Place_name
 Latitude
 Longitude
 Altitude
 Room
 Floor
 Building
 Address
 Street
 City
 County
 State
 Country
 Postal_Code
 Destination. (same as User.Location.)
 Physiology.
 Pulse
 Body_temperature
 Blood_pressure
 Respiration

Person.<name or ID>. (same as User.)

Platform.

UI.

Oral_input_device_availability
 Manual_input_device_availability
 Tactile_output_device_availability
 Visual_output_device_availability
 Auditory_output_device_availability

Platform. (continued)

CPU.

Load
 Speed

Memory.

Total_capacity
 Used

Storage.

Total_capacity
 Used

Connectivity.

Connection_status
 Connection_speed
 Connection_type/device
 Connection_activity

Power.

Power_source
 Power_level

Environment.

People.

Nearest
 Number_present
 Number_close

Local.

Time
 Date
 Temperature
 Pressure
 Wind_speed
 Wind_direction
 Absolute_humidity
 High_forecast_temperature
 Low_forecast_temperature
 People_present
 Ambient_noise_level
 Ambient_light_level
 Days.<previous or future>.
 High_temperature
 Low_temperature
 Precipitation_type
 Precipitation_amount
 Place.<place name>. (same as Environment.Local)

Application.

Mail.

Available
 New_messages_waiting
 Messages_waiting_to_be_sent

Phone.

Available
 In_use
 On/off
 Notification_mechanism
 Call_incoming
 Caller_ID

Sound_recorder.

Available
 Recording

Fig. 15

1) User Setting

a) Mental Context

- i) Meaning
- ii) Cognition
 - (1) Divided User Attention
 - (2) Task Switching
 - (3) Background Awareness
- iii) Solitude
- iv) Privacy
 - (1) Desired Privacy
 - (2) Perceived Privacy
- v) Social Context
- vi) Affect

b) Physical Situation

- i) Body
 - (1) Biometrics
 - (2) Posture
 - (3) Motion
 - (4) Physical Encumberment
 - (a) Senses
 - (i) Eyes
 - (ii) Ears
 - (iii) Tactile
 - (iv) Hands
 - (v) Nose
 - (vi) Tongue
 - (b) Workload demands/effects
 - (c) Interaction with computer devices
 - (d) Interaction with people
 - (e) Physical Health
- ii) Environment
 - (1) Time/Space
 - (2) Objects
 - (3) Persons
 - (a) Audience/Privacy Availability
 - (i) Scope of Disclosure
 - (ii) Hardware affinity for privacy
 - (iii) Privacy Indicator for User
 - (iv) Privacy Indicator for Public
 - (v) Watching Indicator
 - (vi) Being Observed Indicator
- (4) Ambient Interference
 - (a) Visual
 - (b) Audio
 - (c) Tactile

2) Computer

a) Power

b) Configuration

- i) User Input Systems
 - (1) Hand/Haptic
 - (a) Keyboard/Keystrokes
 - (2) Voice/Audio
 - (3) Eye Tracking
 - (4) Cursors
 - (a) Axis
 - (b) Resolution
 - (i) Selection
 - (ii) Invocation
 - (c) Accelerators
- ii) Output Systems
 - (1) Visual
 - (a) Resolution
 - (2) Audio
 - (a) Public/Private
 - (3) Haptic
- iii) External Resources
 - (1) I/O devices
 - (2) Connectivity

c) Data

- i) Quantity/State
- ii) Urgency/Importance
 - (1) Use of Prominence
- iii) Modality
- iv) Sensitivity/Purpose
 - (1) Privacy Issues
 - (2) Use of Association
 - (3) Use of Safety
- v) Source/Ownership
 - (1) Types
 - (a) User generated
 - (b) Other computers or people
 - (c) Sensor
 - (d) PC State
 - (2) Use of Association

Fig. 16

Fig. 17

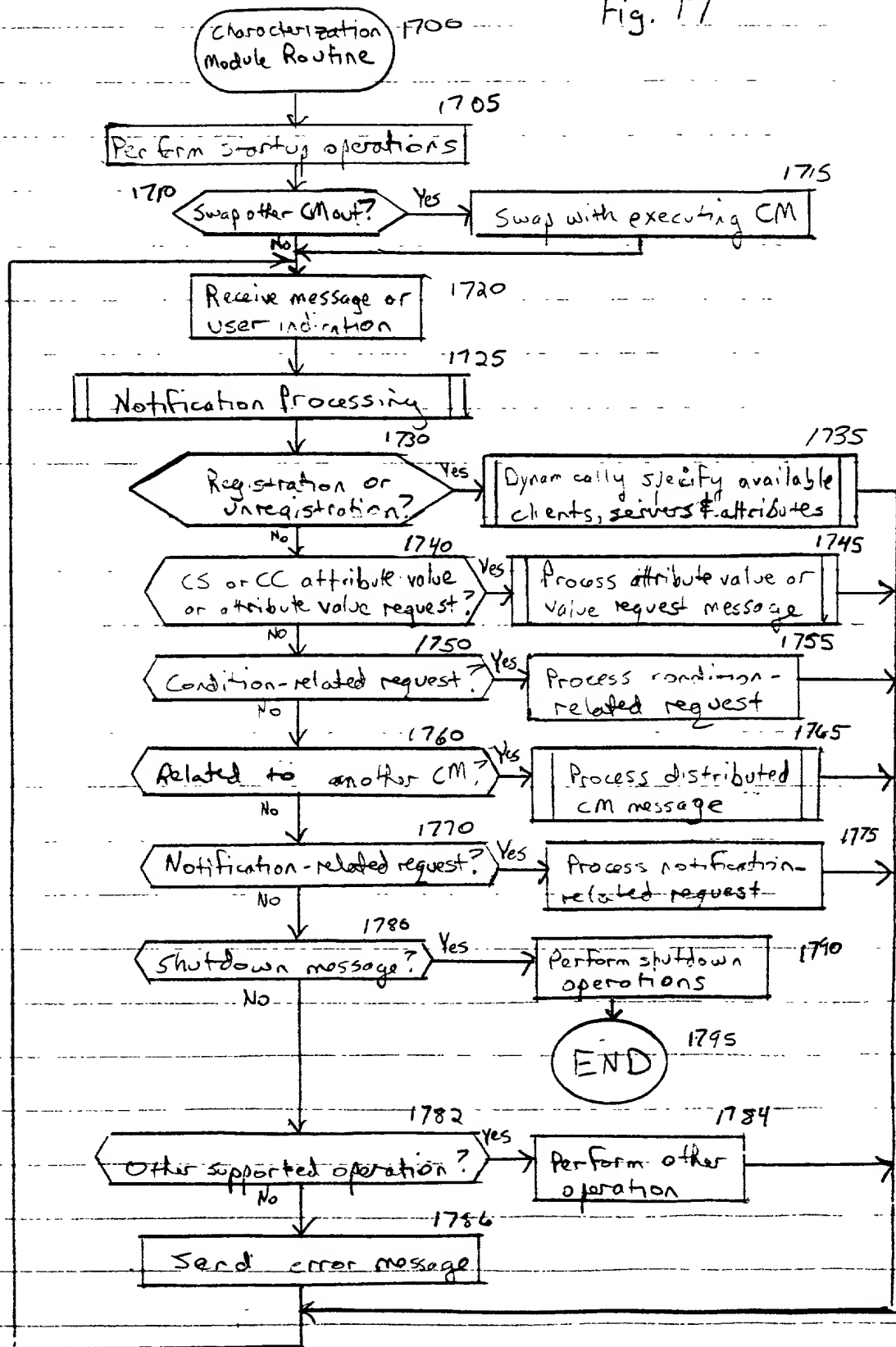


Fig. 18

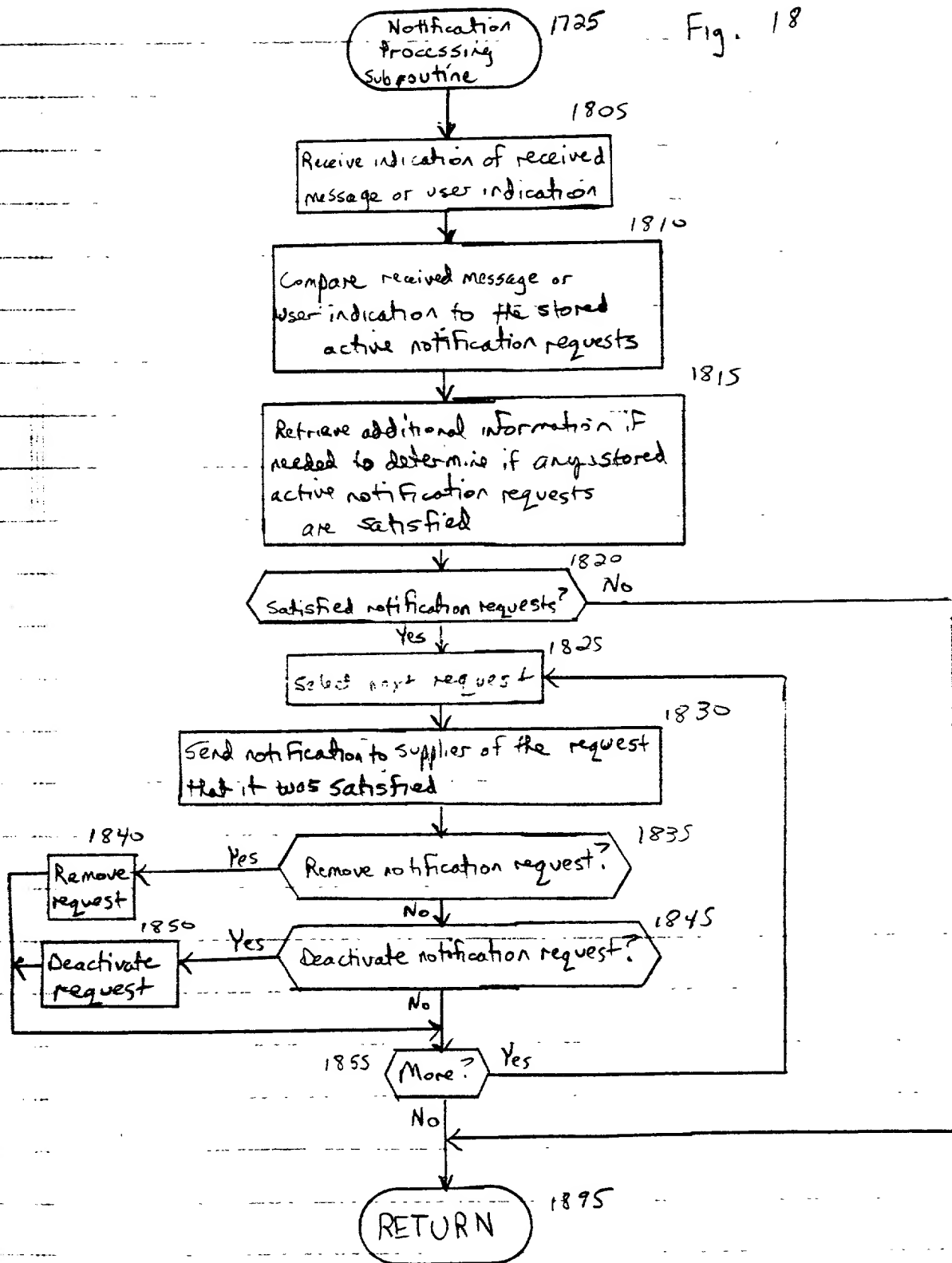
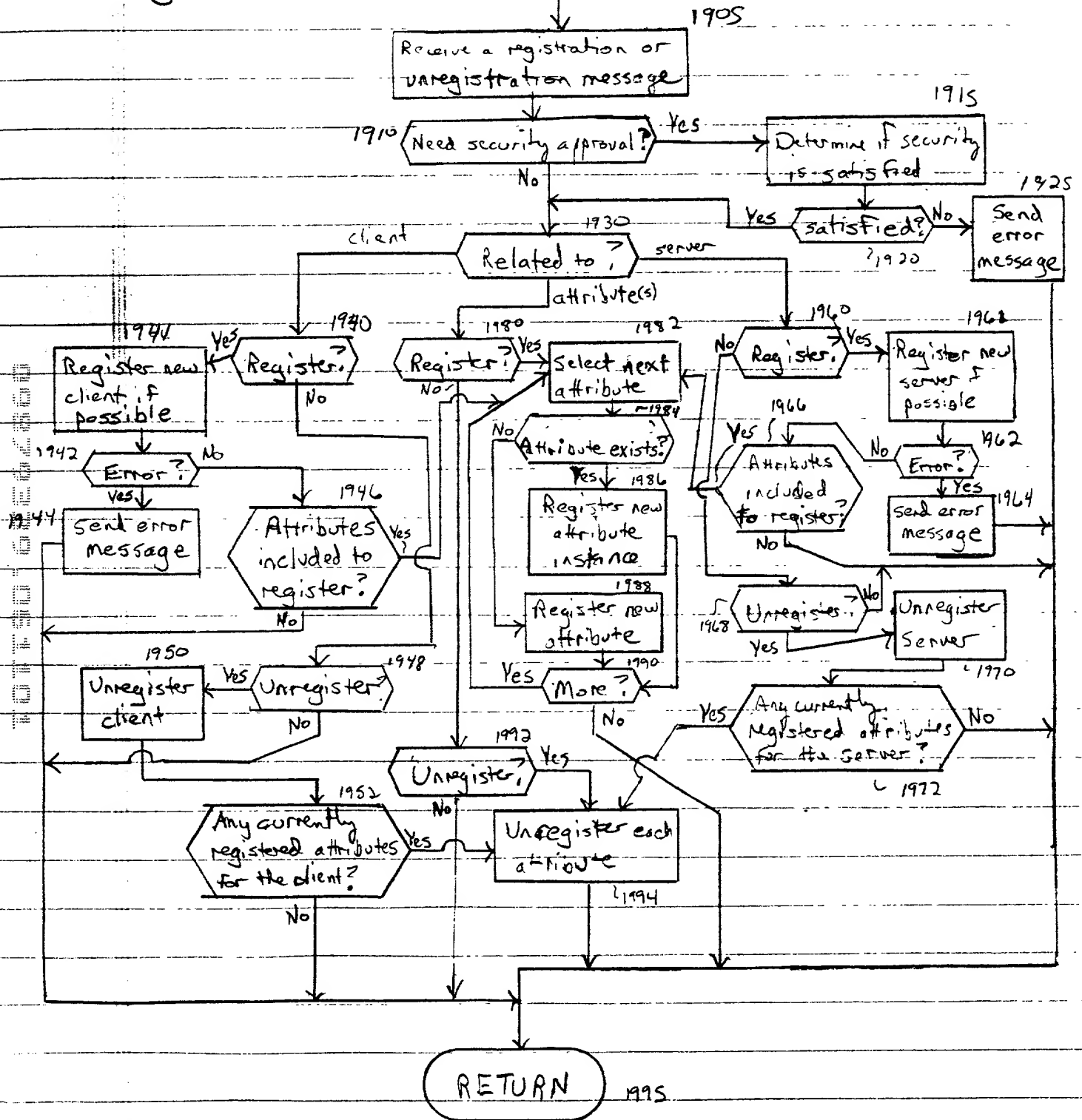


Fig. 19

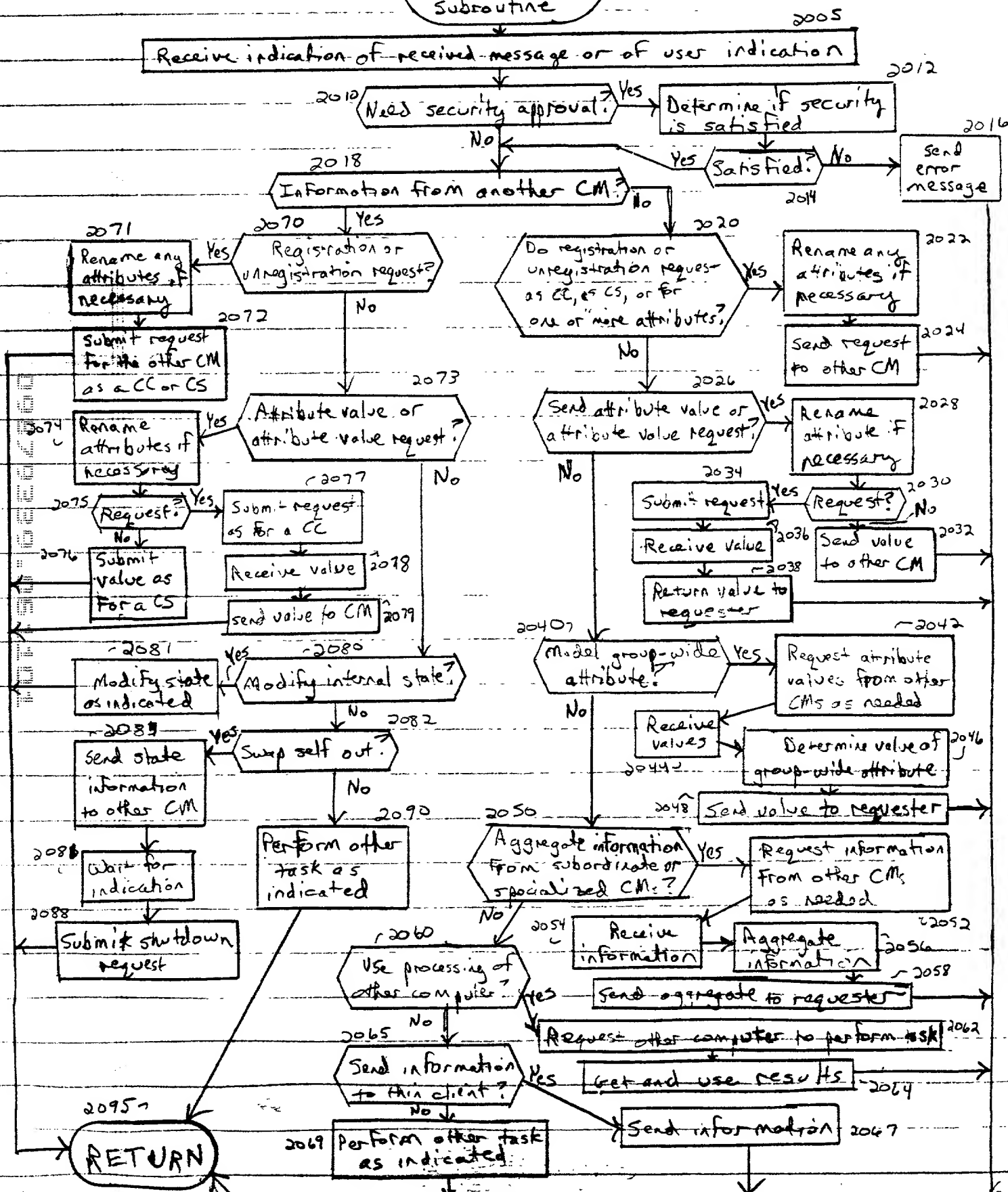
Dynamically Specify Available
Clients, Servers, & Attributes
Subroutine 1735



Process Distributed CM Message Subroutine

1765

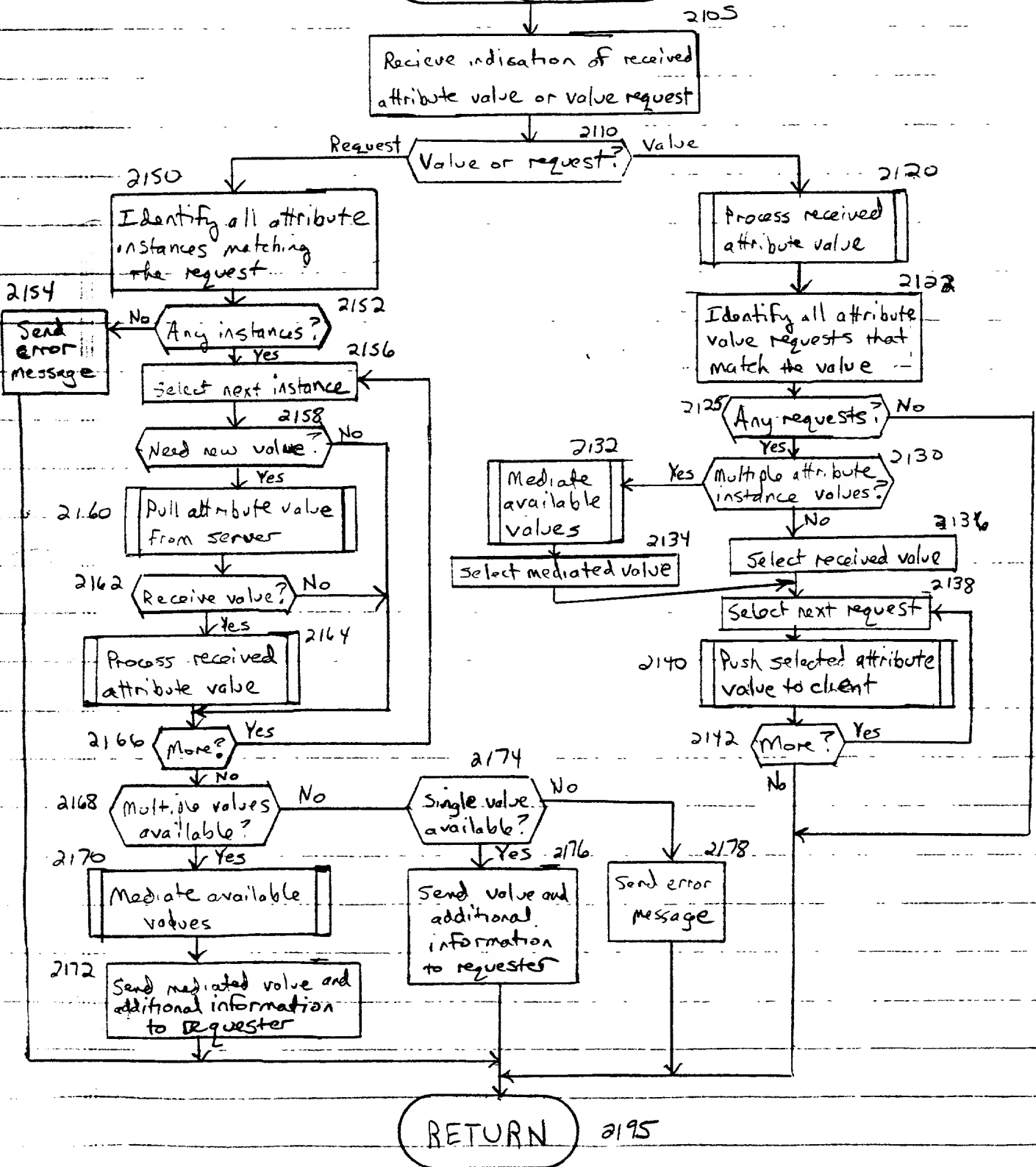
Fig. 20

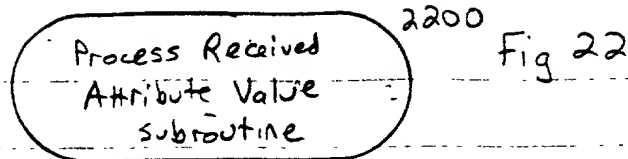


Process Attribute Value
Or Value Request Message
Subroutine

1745

Fig. 21





2205
Receive indication of received attribute value

2215
Send error message

2210
Attribute registered?

2220
Additional information?

2225
Process additional information about received value

2230
Cache value?

2235
Cache value and any additional information

2240
Store value?

2245
Store value and any additional information

2250
Determine if value and any additional information triggers any stored active conditions

2255
Any conditions?

2260
Select next condition

2265
Send message to creator of the condition of its satisfaction

2270
Remove condition?

2275
Remove condition

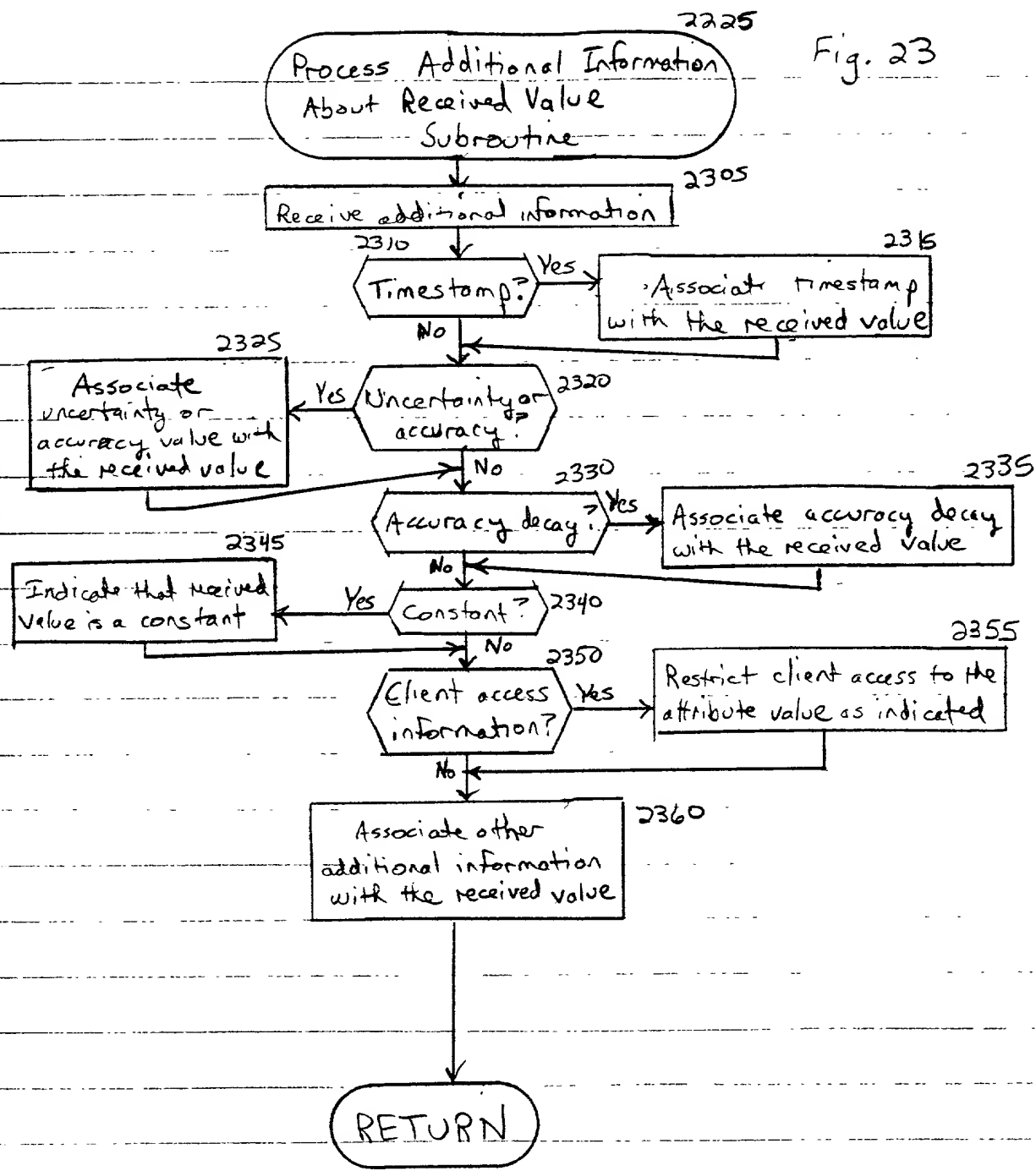
2280
Deactivate condition?

2285
Deactivate condition

2290
More?

2295
RETURN

Fig. 23



Mediate
Available Values
Subroutine 2400

Fig. 24

Receive indication of
available values 2405

Requester of value
supply mediator? 2410

Select supplied
mediator 2415

Suppliers of one or
more of the values indicate
a single mediator? 2420

Select indicated
mediator 2425

Does default mediator
apply to available values? 2430

Select default
mediator 2435

Determine available mediators
that apply to available values 2440

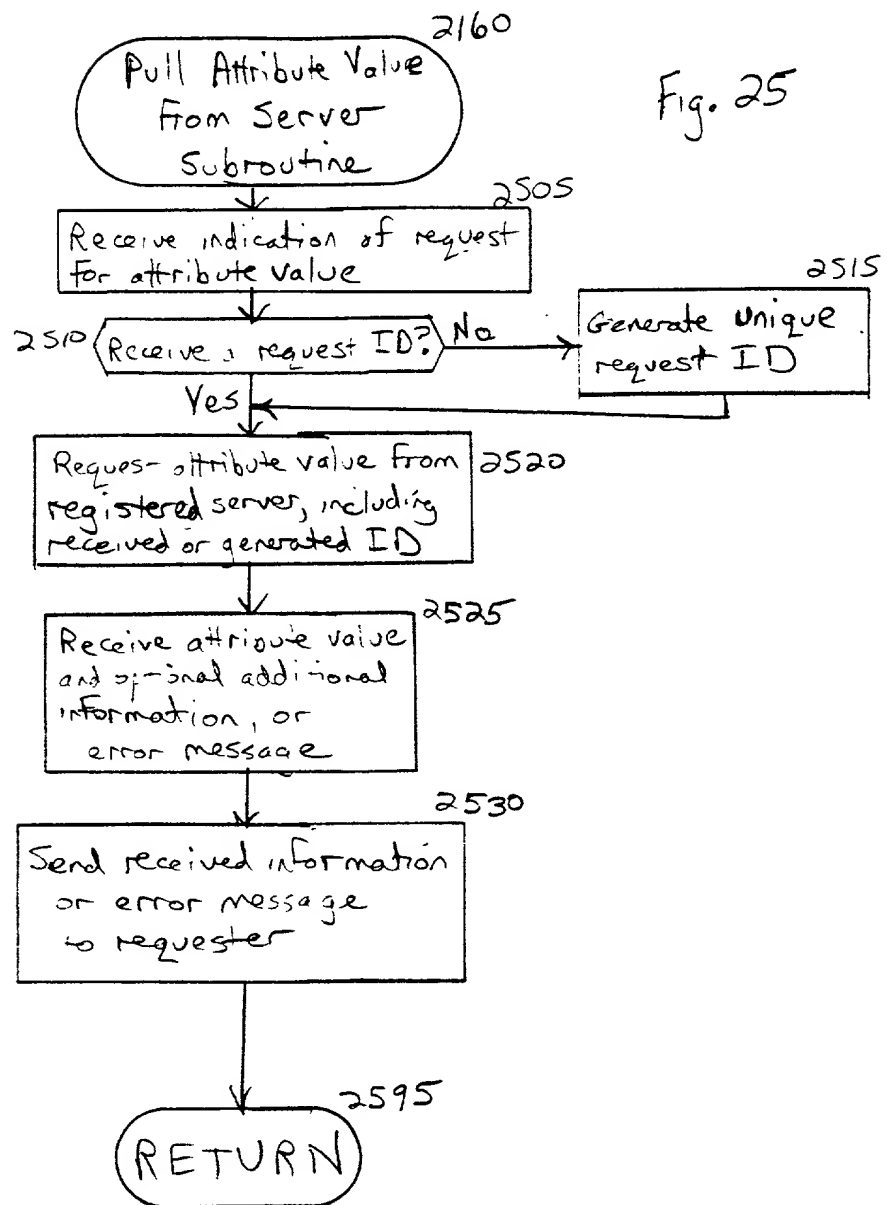
Select one of the
determined mediators 2445

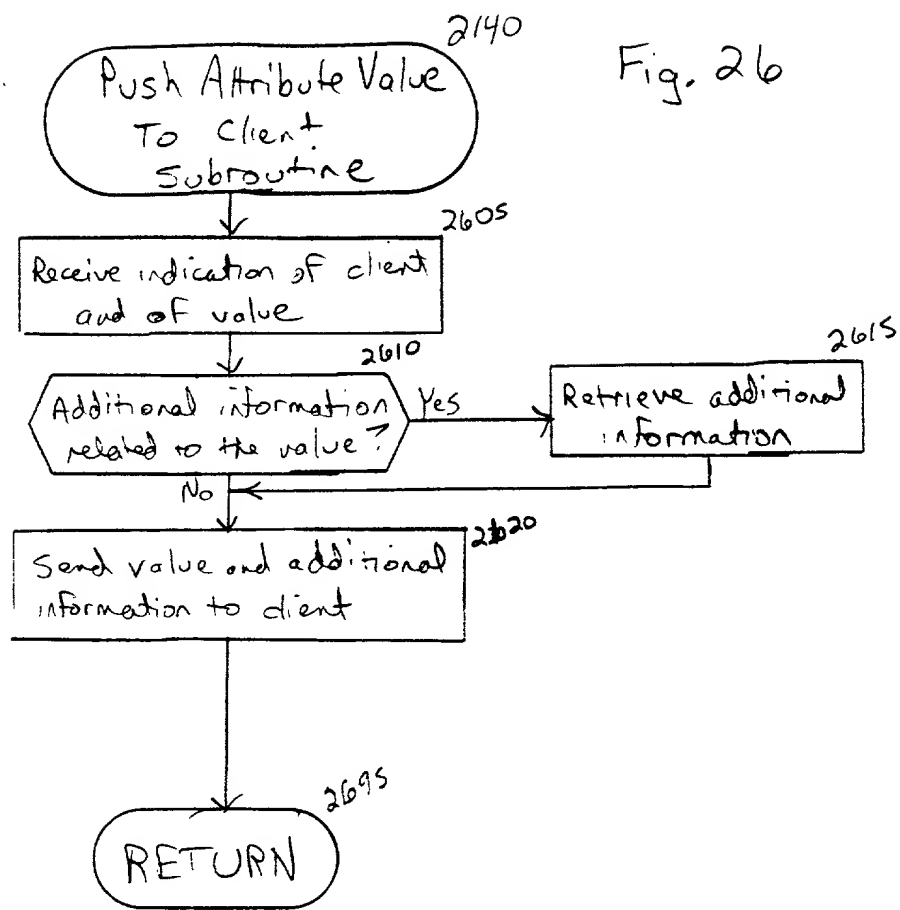
Apply selected mediator to available
values to select a value or to generate
an aggregate value 2450

Return mediated value 2455

RETURN

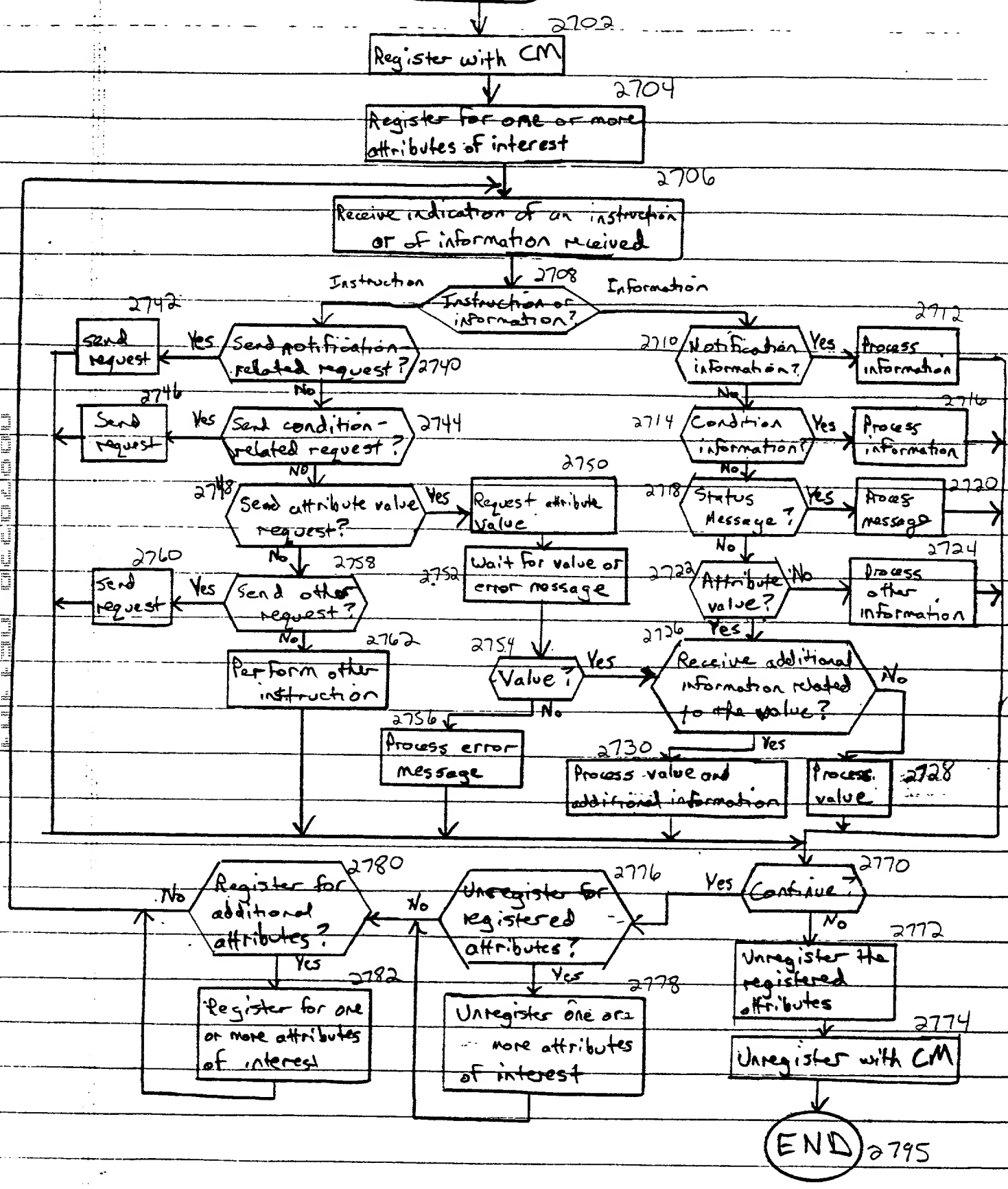
Fig. 25





Context Client Routine 2700

Fig. 27



Context Server Routine 2800

Fig. 28

